

(12) UK Patent Application (19) GB (11) 2 364 558 (13) A

(43) Date of A Publication 30.01.2002

(21) Application No 0017197.5

(22) Date of Filing 10.07.2000

(71) Applicant(s)

Avon Vibration Management Systems Limited
(Incorporated in the United Kingdom)
Bumpers Way, CHIPPENHAM, Wiltshire, SN14 6NF,
United Kingdom

(72) Inventor(s)

Ian Nicholson

(74) Agent and/or Address for Service

Mewburn Ellis
York House, 23 Kingsway, LONDON, WC2B 6HP,
United Kingdom

(51) INT CL⁷

F16F 1/38

(52) UK CL (Edition T)

F2S SCF S708
U1S S2010

(56) Documents Cited

GB 2115080 A
GB 0890991 A

GB 2103757 A
GB 0653982 A

(58) Field of Search

UK CL (Edition S) F2S SCF
INT CL⁷ F16F 1/373 1/38
Online WPI, EPODOC, JAPIO

(54) Abstract Title

A resilient bushing

(57) A bush comprises a central anchor part 20 that is held within an outer anchor sleeve 27 and a resilient body 26 which connects the central anchor part 20 to the outer anchor sleeve 27. The central anchor part 20 has a circumferential ridge (21 in Fig.2) at an intermediate position along its length and the outer anchor sleeve 27 is crimped around its circumference at respective positions A, B adjacent or beyond each axial end of the ridge. The ridge (21 in Fig.2) has a circumferential groove 22 which enables the outer anchor sleeve 27 to be crimped at an axial position C corresponding to the groove 22. Thus the additional crimping at the position C increases the axial stiffness of the bush.

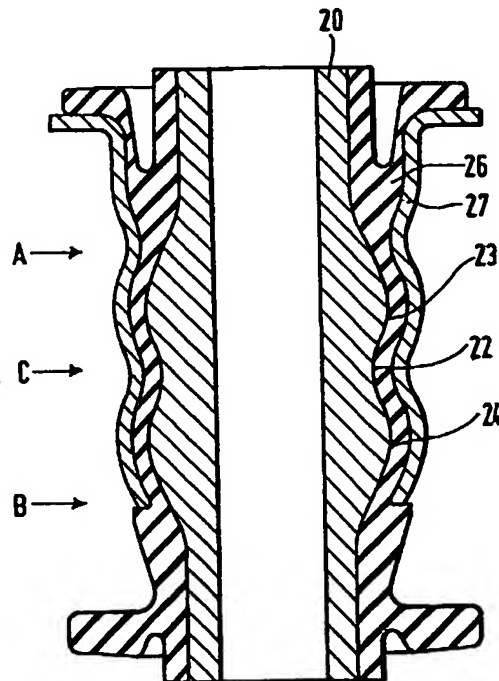


Fig.4.

Best Available Copy

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

GB 2 364 558 A

1/4

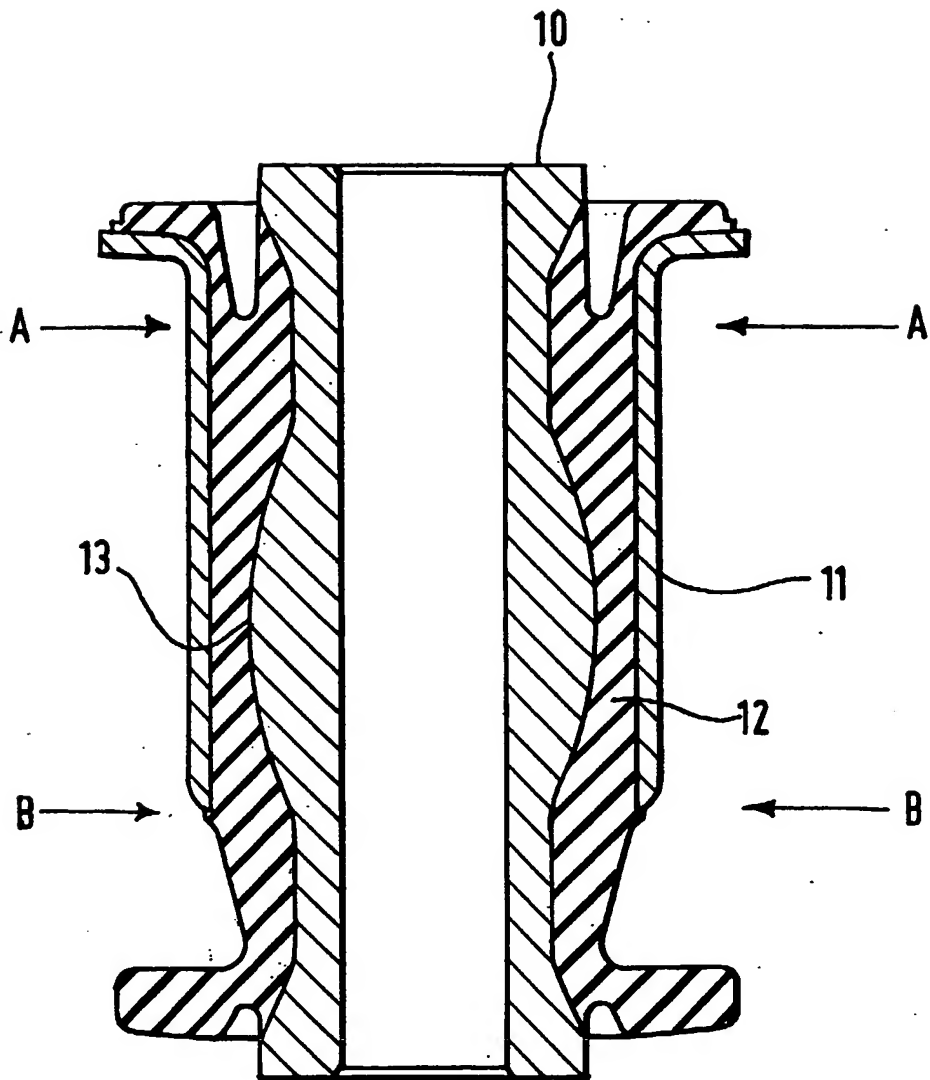


Fig.1.

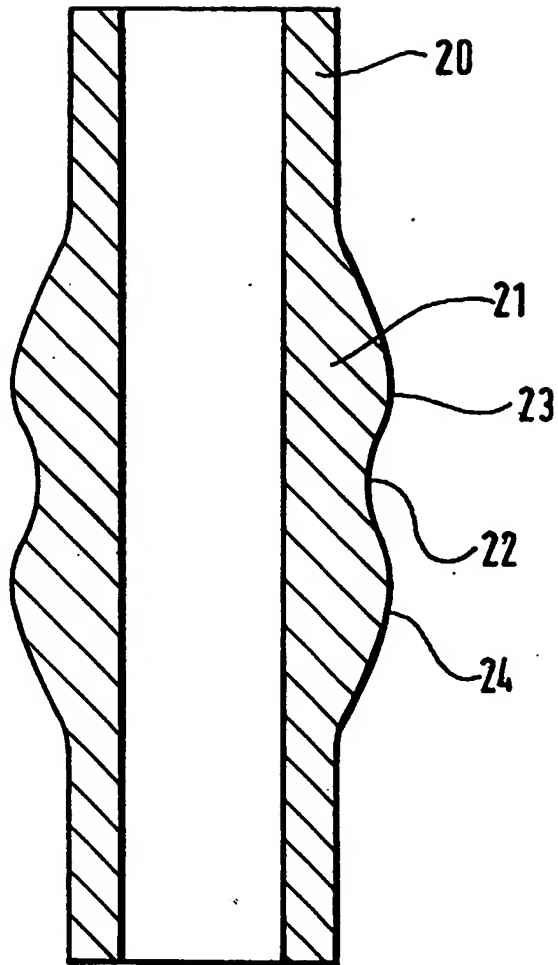


Fig.2.

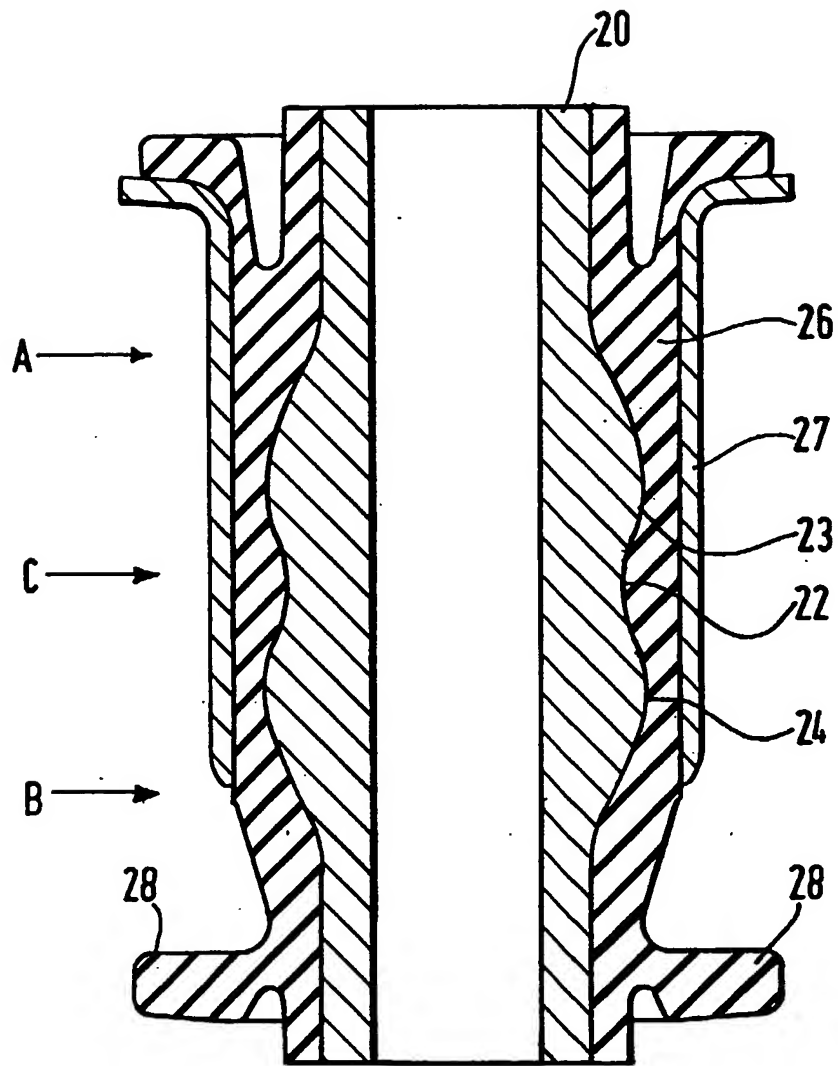


Fig.3.

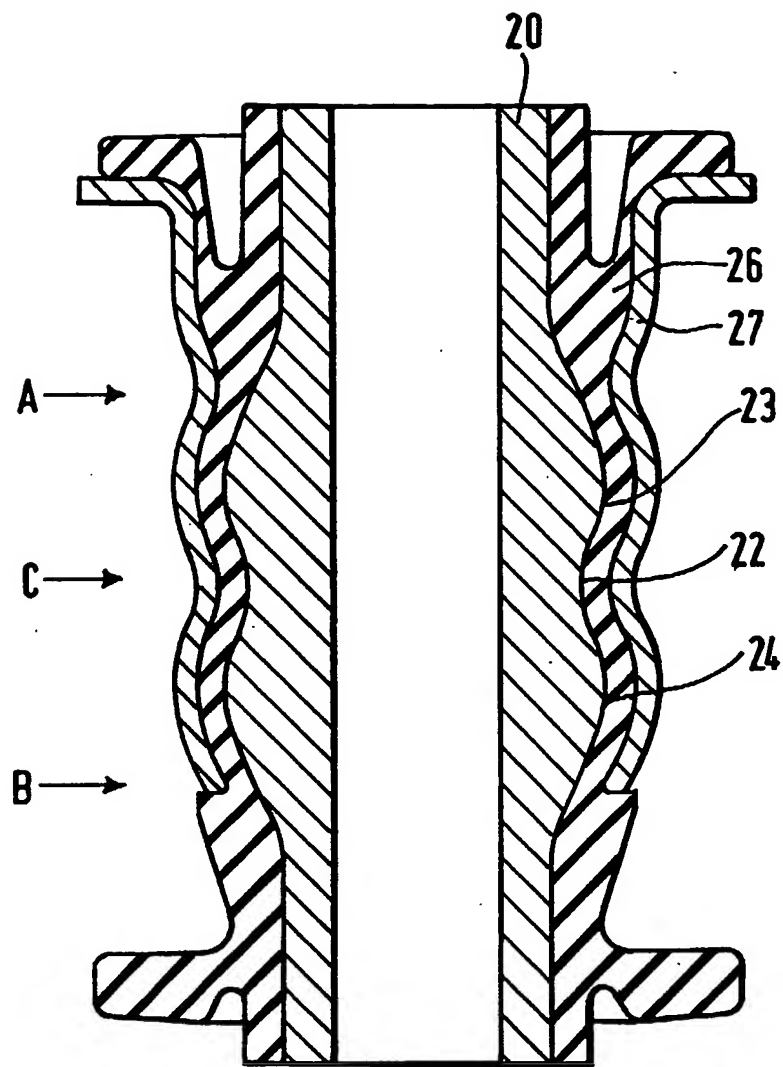


Fig.4.

BUSH

The present invention relates to a bush in which a central anchor part is connected by a resilient body to an outer anchor part in the form of a sleeve. Such bushes are used for example, to interconnect vibration parts to permit some relative movement, but to prevent excessive movement between components connected to the central anchor part and sleeve respectively.

Fig. 1 of the accompanying drawings shown a known type of bush in which a first (central) anchor part forming an outer anchor part in the form of a tube 10 is connected to an outer sleeve 11 by a resilient body 12 of eg rubber. As can be seen from Fig. 1, the tube 10 has a circumferential ridge 13 at an intermediate position along its length the ridge projecting radially outwardly towards the sleeve 11. Once the structure shown in Fig. 1 has been formed, the sleeve 11 is crimped radially inwardly around its circumference at the points indicated by arrows A and B, thereby compressing the body 12 radially at those points and thus securing the sleeve 11 in place.

In the resulting structure, movement is possible between the tube 10 and the sleeve 11 both radially, torsionally, and axially along the length of the sleeve 11, but such movement is resisted by the resilience of the body 12.

The present invention seeks to provide bush of the general

type shown in Fig. 1, but in which the resistance to axially movement is significantly increased.

At its most general, the present invention proposes that the ridge on the inner anchor point (which is normally in the form of a tube as in the prior art) has a circumferential groove therein. The sleeve is then crimped not only adjacent or beyond axial ends of the ridge, as in Fig. 1, but also at an axial position corresponding to the groove.

Preferably the crimping is such that the minimum outer diameter of the sleeve at the least one of the points of crimping is less than or equal to the maximum inner diameter. Thus, the depth of the crimping is at least as great as the thickness of the sleeve.

An embodiment of the present invention will now be described in detail, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a sectional view through known bush;

Fig. 2 shows a central anchor part to be used in the present invention;

Fig. 3 shows a bush according to the present invention before crimping of the sleeve; and

Fig. 4 shows a bush according to the present invention after crimping of the sleeve.

Referring first to Fig. 1, a bush being a first embodiment of the present invention has a central anchor part in the form of a tube 20 with a projecting ridge 21, as in the arrangement of Fig. 1. Unlike the arrangement of Fig. 1, however, the ridge 21 has a circumferential groove 22 therein, so that the ridge 21 has peaks 23, 24, on either side of that groove 22.

Then, as shown in Fig. 3, a resilient body 26 is formed on the tube 20, and a sleeve 27 formed axially outwardly of the body 26.

The sleeve 27 is then circumferentially crimped at the points indicated by arrows A and B, at each axial end of the ridge 21, as in the bush of Fig. 1, but a further crimp is formed at the point indicated by arrow C, at a position corresponding to the groove 22. The crimps at points A, B and C extend circumferentially around the bush.

The resulting bush is shown in Fig. 4. The crimping is such that the minimum outer diameter of the sleeve 27 at crimps A, B and C is less than or equal to the final inner diameter of the sleeve 27 at its maximum diameter after swaging and crimping.

By providing the groove 22 and the additional crimping at point C, the axial stiffness of the bush is increased.

CLAIMS:

1. A bush comprising a central anchor part held within an outer anchor sleeve, and a resilient body connecting the central anchor part to the outer anchor sleeve, the
5 central anchor part having a circumferential ridge at an intermediate position along its length, there being a respective crimp in the outer anchor sleeve adjacent or beyond each axial end of the ridge, each crimp extending around the circumference of the outer anchor
10 sleeve, wherein the ridge has a circumferential groove and the outer anchor sleeve has a further crimp at an axial position corresponding to the groove.

2. A bush according to claim 1, wherein the crimps of
15 the outer anchor sleeve are such that the minimum outer diameter of the outer anchor sleeve at the least one of the crimps is less than or equal to the maximum inner diameter of the outer anchor sleeve.

20 3. A bush substantially as hereinbefore described, as with reference to and as illustrated in Figs. 3 and 4 of the accompanying drawings.



Application No: GB 0017197.5
Claims searched: 1-3

Examiner: Kevin Hewitt
Date of search: 25 October 2001

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): F2S (SCF)

Int Cl (Ed.7): F16F 1/373, 1/38

Other: Online WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2115080 A (DAIMLER BENZ) See Figure.	-
A	GB 2103757 A (BTR) See Fig.4	-
X	GB 0890991 A (TIDD) See especially Fig.1	1,2
A	GB 0653982 A (CLAYTON-WRIGHT) See all Figs.	-

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

& Member of the same patent family

A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.

B Patent document published on or after, but with priority date earlier than, the filing date of this application.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.